

Notice of Allowability

Application No.

10/808,416

Examiner

Antonio A. Caschera

Applicant(s)

KIUCHI ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 01/16/07.
2. ☒ The allowed claim(s) is/are 1-4, 8-10, 16-21, 24 and 25.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in the pending application.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jeffrey Filipek on 03/19/07. The substance of the interview can be seen within the attached Examiner-Initiated Interview Summary form.

The application has been amended as follows:

WHAT IS CLAIMED IS:

1. *(Currently amended) A display control device for outputting an output image signal, said display control device comprising:
a characteristic value-calculating unit ~~operable to calculate for calculating a~~
characteristic value based on an input image signal; and*

a conversion characteristic-calculating unit ~~operable to determine~~for determining at least one conversion characteristic adaptively with respect to the input image signal based on the characteristic value,

wherein said conversion characteristic-calculating unit is ~~operable to determine~~further for determining the at least one conversion characteristic such that, when an abscissa axis represents the input image signal and an ordinate axis represents the output image signal, and a range from an origin of the axes to a full scale point along the abscissa axis is divided into a low level region, which is close to the origin, a high level region, which is close to the full scale point, and a middle level region, which is positioned between the low level region and the high level region, an average slope of the output image signal in the middle level region is greater than any one of average slopes of the output image signal in the low and high level regions.

2. *(Currently amended) The display control device as defined in claim 1, wherein said characteristic value-calculating unit is ~~operable to calculate~~further for calculating a plurality of characteristic values based on the input image signal.*

3. *(Currently amended) The display control device as defined in claim 1, further comprising a signal-converting unit ~~operable to convert~~for converting the input image signal in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit.*

4. *(Currently amended) The display control device as defined in claim 1, further comprising:*

a signal-converting unit ~~operable to convert~~for converting the input image signal in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit; and

a weight-calculating unit ~~operable to apply~~for applying a mask to the input image signal in accordance with a weighting characteristic to generate a masked image signal, wherein:

said characteristic value-calculating unit is ~~operable to calculate~~further for calculating the characteristic value based on the masked image signal generated by said weight-calculating unit; and

said conversion characteristic-calculating unit is ~~operable to determine~~further for determining the at least one conversion characteristic based on the characteristic value.

5-7. (Cancelled)

8-10. (Previously presented)

11-15. (Cancelled)

16-17. (Previously presented)

18. (Currently amended) The display control device as defined in claim 1, further comprising a signal-converting unit ~~operable to convert~~for converting the input image signal in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit,

wherein said characteristic value-calculating unit is ~~operable to output~~further for outputting a signal that adjusts an output level of said signal-converting unit and a light emission level of an external light source in a correlated manner.

19. (Currently amended) The display control device as defined in claim 1, further comprising:

a signal-converting unit ~~operable to convert~~for converting the input image signal in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit; and

a light source-adjusting unit ~~operable to adjust~~for adjusting an output image signal to be fed to a display panel and a light emission control signal to be fed to an external light source in a correlated manner based on an output image signal of said signal-converting unit.

20. (Currently amended) The display control device as defined in claim 18, wherein when a maximum ordinate value of the at least one conversion characteristic falls below a threshold value, said characteristic value-calculating unit is ~~operable to perform~~further for performing an adjustment so as to raise the output level of said signal-converting unit and to lower the light emission level of the external light source.

21. (Currently amended) The display control device as defined in claim 18, wherein when a maximum ordinate value of the at least one conversion characteristic exceeds a threshold value, said characteristic value-calculating unit is ~~operable to perform~~further for performing an adjustment so as to raise the light emission level of the external light source.

22-23. (Cancelled)

24. (Currently amended) A display device comprising:

a display unit; and

a display control device ~~operable to output~~for outputting an output image signal, and to ~~control~~controlling said display unit by using the output image signal, said display control device comprising:

a characteristic value-calculating unit ~~operable to calculate~~for calculating a characteristic value based on an input image signal; and

a conversion characteristic-calculating unit ~~operable to determine~~for determining at least one conversion characteristic adaptively with respect to the input image signal based on the characteristic value,

wherein said conversion characteristic-calculating unit is ~~operable to determine~~further for determining the at least one conversion characteristic such that, when an abscissa axis represents the input image signal and an ordinate axis represents the output image signal, and a range from an origin of the axes to a full scale point along the abscissa axis is divided into a low level region, which is close to the origin, a high level region, which is close to the full scale point, and a middle level region, which is positioned between the low level region and the high level region, an average slope of the output image signal in the middle level region is greater than any one of average slopes of the output image signal in the low and high level regions; and
wherein said characteristic value-calculating unit is ~~operable to calculate~~further for calculating a plurality of characteristic values based on the input image signal.

25. (Currently amended) A display device as defined in claim 24,

wherein said display control device further comprises a signal-converting unit ~~operable to convert~~for converting the input image signal in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit; and

wherein said display unit further comprises:

a display panel ~~operable to display~~for displaying an image, by inputting an output image signal from said signal-converting unit, the output image signal having been adjusted in output levels in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit of said display control device; and

a light source ~~operable to illuminate~~for illuminating said display panel with an emission level controlled in accordance with the at least one conversion characteristic determined by said conversion characteristic-calculating unit of said display control device.

26-30. (Cancelled)

Allowable Subject Matter

3. Claims 1-4, 8-10, 16-21, 24 and 25 are allowed.

The following is an examiner's statement of reasons for allowance:

In reference to claims 1 and 24, the prior art of record does not explicitly disclose the conversion characteristic determined assuming an abscissa axis showing an input image, ordinate axis showing an output image, a scale along the abscissa axis having low, middle and high regions wherein the average slope of the output image signal is greater in the middle region than

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any one of average slopes on the output image in the low and high regions, in combination with the further limitations of claims 1 and 24 respectively.

In reference to claims 2-4, 8-10, 16-21 and 25, claims 2-4, 8-10, 16-21 and 25 depend upon allowable claims 1 and 24 and are therefore also deemed allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

4. The Office notes the cancellation of claim 15 and the addition of claim 15's objected to for containing allowable subject matter into claims 1 and 24 respectively. Therefore, all pending claims are deemed allowable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung, can be reached at (571) 272-7794.

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Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (571) 272-2600.

aac



3/19/07

Antonio Caschera

Patent Examiner



KEE M. TUNG
SUPERVISORY PATENT EXAMINER